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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,020	12/01/2000	Richard G. Ogier	SRI/4297-2	6111

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EXAMINER	
CHOUDHURY, AZIZUL Q	
ART UNIT	**PAPER NUMBER**
2145	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/728,020	OGIER ET AL.	
	Examiner	Art Unit	
	Azizul Choudhury	2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

This office action is in response to the correspondence received on November 9, 2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta et al ("An Adaptive Protocol for Reliable Multicast in Mobile Multi-hop Radio Networks," (IEEE, 1999)) in view of Humblet et al (US Pat No: 5,671,357), hereafter referred to as Gupta and Humblet, respectively.

1. With regards to claim 1, Gupta teaches through Humblet a multi-hop network including a plurality of nodes that each maintains a table of network topology, a method for disseminating topology and link-state information over the multi-hop network, comprising: maintaining a path tree for each source node in the network that can produce an update message (section 2, Gupta), each path tree having that source node as a root node, a parent node, and zero or more children nodes (equivalent to core, source and children nodes (section 3.1.1, Gupta)); receiving an update message from the parent node in accordance with the path tree maintained for the source node that originated the received update message, the update message including information related to a link in the network; updating the table of network topology in response to the

information in the update message received via the path tree; and forwarding the update message to children nodes, if any, in accordance with the path tree maintained for the source node that originated the update message in response to the information in the received update message, if it is determined that the update message should be forwarded to the zero or more children nodes, such that topology information for the network is globally updated across the plurality of nodes (Gupta teaches the using path/link presence information. A node is able to send data to its children who replied to the acknowledgement messages since; they are the nodes that are known to be present. Plus, Gupta also teaches that a node is able to receive a message and is able to forward the message down the tree to the children nodes (section 3.5). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

2. With regards to claim 2, Gupta teaches through Humblet a method wherein the information related to the link indicates whether the update message is to be forwarded to other nodes (Acknowledgement means are taught by Gupta (section 3.1.1, second paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

3. With regards to claim 3, Gupta teaches through Humblet a method wherein the path tree associated with each source node is a minimum-hop-path tree (Gupta teaches a multi-hop method (section 2, first paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based

on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

4. With regards to claim 4, Gupta teaches through Humblet a method further comprising obtaining link-state information from one or more nodes in the path tree maintained for a given source node for use in developing the path tree to that source node (Gupta teaches acknowledgement means (section 3.1.1, second paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

5. With regards to claim 5, Gupta teaches through Humblet a method wherein the link is a wireless communication link (The network taught in Gupta's disclosure is mobile and hence wireless (section 2, first paragraph, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

6. With regards to claim 6, Gupta teaches through Humblet a method further comprising sending a new parent message to a node selecting that node as a new parent node for the source node originating the update message (Tree architectures allow for changes to node layouts to occur, which means that parents may become children and children may become parents. Gupta suggest within the disclosure that such means are also present (section 3.1.1, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

7. With regards to claim 7, Gupta teaches through Humblet a method further comprising receiving from the new parent node in response to the new parent message link-state information associated with the source node that originated the update message (Gupta teaches the transferring of messages between all the nodes (sections 3.1 and 3.1.1, Gupta). In addition, the layout of the nodes is allowed to change, as stated above. However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to

provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

8. With regards to claim 8, Gupta teaches through Humblet a method wherein the new parent message included a serial number and the link-state information received in response to the new parent message is associated with update messages having serial numbers that are greater than the serial number included in the new parent message (One of the major purposes of the multi-hop network is to obtain the status of the network. In addition, sequence numbers (equivalent to serial numbers) are provided (section 3.1.1, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

9. With regards to claim 9, Gupta teaches through Humblet a method further comprising: determining that a path through a new parent node for the source node

originating the update message has the same number of node hops as the path through the current parent node, and maintaining the current parent node as the parent node for the given source node (Another incentive of the tree architecture is that messages are able to record which nodes were visited (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

10. With regards to claim 10, Gupta teaches through Humblet a method further comprising: determining that a path to the source node originating the update message ceases to exist; and maintaining the current parent node as the parent node for the source node (In tree network architectures, data is able to route itself by looking ahead to see if a path is available. In addition, Gupta teaches that data is able to route itself (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

11. With regards to claim 11, Gupta teaches through Humblet a method further comprising: broadcasting the update message to the children nodes if the number of children nodes exceeds a predefined threshold when forwarding the update message to children nodes (Gupta teaches the monitoring and constant updating of the topology (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to

provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

12. With regards to claim 12, Gupta teaches through Humblet a method further comprising transmitting the update message to each child node using a unicast mode if the number of children nodes is less than a predefined threshold when forwarding the update message to children nodes (Gupta teaches a design where messages can be transmitted by unicast as needed (section 2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

13. With regards to claim 13, Gupta teaches through Humblet a method further comprising: computing a parent node for each neighbor node and source node; and determining which neighbor nodes are children nodes for a given source node (For a

tree network architecture to function properly, means must be present by which to detect the parent node and children nodes. Gupta teaches data structures within the nodes to identify themselves (section 3.2, Gupta). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

14. With regards to claim 14, Gupta teaches through Humblet a network, comprising: a plurality of nodes in communication with each other over communication links, each node maintaining a path tree for each source node in the network that can produce an update message (section 2, Gupta), each path tree having that source node as a root node, a parent node, and zero or more children nodes (equivalent to core, source and children nodes (section 3.1.1, Gupta)), wherein one of the nodes (i) receives an update message from the parent node in accordance with the path tree maintained for the source node that originated the received update message, the update message

including information related to a link in the network, (ii) updates the table of network topology in response to the information in the received update message, (iii) and forwards the update message to children nodes, if any, in accordance with the path tree maintained for the source node that originated the update message in response to the information in the update message received via the path tree, if it is determined that the update message should be forwarded to the children nodes (Gupta teaches the using path/link presence information. A node is able to send data to its children who replied to the acknowledgement messages since; they are the nodes that are known to be present. Plus, Gupta also teaches that a node is able to receive a message and is able to forward the message down the tree to the children nodes (section 3.5). However, Gupta does not teach the existence of tables within the nodes for the storage and updating of topology information.

In the same field of endeavor, Humblet teaches a network system where the nodes each maintain a database (tables) with topology information (column 3, lines 50-59, Humblet). In addition, the topology information within each node is updated based on events (change to the topology) (column 2, lines 23-25, Humblet). Therefore, it would have been obvious to one skilled in the art, during the time of the invention, to have combined Gupta's multi-hop network with the network taught by Humblet, to provide path computation for establishing communication between nodes (Humblet (column 1, lines 15-21, Humblet)).

Response to Remarks

The claim amendments received on November 9, 2006 has been carefully examined but is not deemed fully persuasive. Only minor claim amendments were made to independent claims 1 and 14 for clarification purposes. The following are the examiner's responses to the remarks issued with the amendment.

The first point of contention issued by the applicant states that neither prior arts teach (alone or in combination): *"a method and network whereby network topology information is globally updated across the nodes in the network when each node updates a respective table of network topology based on update messages that are distributed in accordance with path trees rooted at the sources of the update message."* The problem with this assertion is that it does not accurately depict the claim language. The language of "path trees rooted at the sources of the update message" was never claimed. The claim language features emphasized by the applicant in the same argument are of: "updating the table of network topology in response to the information in the update message received via the path tree," and "such that the topology information for the network is globally updated across the plurality of nodes." The applicant insists that the Gupta and Humblet prior arts do not teach such features. The examiner disagrees with this assertion. Gupta in view of Humblet teaches the trait of "updating the table of network topology in response to the information in the update message received via the path tree." Gupta teaches how event messages (such as a new node is joining or a node is still connected) are sent throughout the nodes (section

2 and section 3.5, Gupta). The messages travel via a multi-hop technique, allowing the messages to travel through nodes through their path tree. Humblet teaches how each of the nodes is able to maintain its own event databases (tables) (column 3, lines 50-59, Humblet) so that event messages can be stored within each node. Gupta in view of Humblet also teaches the trait of "such that the topology information for the network is globally updated across the plurality of nodes." This is true because Gupta states that the multi-hop network "guarantees message delivery to all multicast nodes..." (Abstract, Gupta).

The second point of contention involves the statement: *"Gupta does not teach of suggest disseminating update messages that convey information about incremental changes in topology and link states (e.g. without regard to actual data traffic) in accordance with an existing path tree rooted at the source of the update."* Again, the problem with this assertion is that it is not quite what is claimed. For instance, "*incremental changes*" are not claimed, nor is "*existing path tree rooted at and maintained for the source*" as later argued. The relevant claim language actually reads: "receiving an update message from the parent node in accordance with the path tree maintained for the source node that originated the received update message, the update message including information related to a link in the network; updating the table of network topology in response to the information in the update message received via the path tree..." Update messages are not claimed to be incremental. The update messages are claimed to include link information. Again, Gupta teaches how event messages (such as a new node is joining or a node is still connected) are sent

throughout the nodes (section 2 and section 3.5, Gupta). Join and connection information is link information.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Azizul Choudhury whose telephone number is (571) 272-3909. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Cardone can be reached on (571) 272-3933. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC

JASON CARDONE
SUPERVISORY PATENT EXAMINER